Catalogue of American Amphibians and Reptiles.

MARTOF, BERNARD S. 1974. *Siren.*

Siren Linnaeus
Sirens

Siren Linnaeus, 1766, sign. Rrrr 5, Addenda (not paged). Type species, *Siren lacertina*, 1766, by monotypy.
Sirena: Harlan, 1827:321. Emendation.
Phanerobranchus Leuckart, 1821:260. Absolute synonym.
Sirène: Vaillant, 1863:295. Emendation.

• CONTENT. Two species are extant, *S. lacertina* and *S. intermedia.* Fossil species include *S. simpsoni* (Pliocene, Florida), *S. hesterna* (Miocene, Florida) and *S. dunni* (Eocene, Wyoming). See REMARKS.

• DEFINITION. These large, aquatic, eel-like salamanders possess only the pectoral limbs, each with 4 digits. The gills are persistent. See familial and specific accounts.

• DIAGNOSIS. The co-familial *Pseudobranchus* closely resembles *Siren* but is more limited geographically, has only 3 digits per limb, is much smaller and is striped. Members of the genus *Siren* are rather uniformly pigmented and, except for juveniles, completely devoid of stripes. *Pseudobranchus* also has a more slender body, a more pointed head, and a single pair of gill slits. Unlike *Pseudobranchus*, the skin of *Siren* transforms. The epidermis thickens (Czopek, 1962) and consists of 4 to 6 layers of cells as in most adult amphibians.

Fossil vertebrae can be identified by the following characteristics (Goin and Auffenberg, 1955): the lower margin of the centrum of *Siren* is straight, whereas that of *Pseudobranchus* is distinctly concave. In *Siren* the zygapophyseal ridge is nearly straight and it meets the transverse process at the base of the prezygapophysis but in *Pseudobranchus* it curves downward and fuses with the transverse process at a point posterior to the base of the prezygapophysis. Furthermore, at its junction with the transverse process the zygapophyseal ridge tends to flare less in *Siren* than in *Pseudobranchus*. For diagnostic features of extinct species of *Siren* see FOSSIL RECORD.

• ILLUSTRATIONS. See species accounts. Other useful drawings include: vertebrae of fossils (Goin and Auffenberg, 1955; 1957); dorsal view of head and gills and comparison with *Pseudobranchus* (Noble, 1931:161); olfactory capsule of *Siren* and comparison with other salamanders (Hilton, 1951a); head muscles and comparison with *Pseudobranchus* (Hilton, 1959); skin of *Siren* and comparison with other amphibians (Bernstein, 1953); sound-transmitting apparatus (Hilton, 1949); teeth (Hilton, 1951b); male urogenital system (Willett, 1965).

• DISTRIBUTION. Sirens inhabit the Coastal Plain of southeastern United States from the District of Columbia to Florida and westward in the Gulf states to extreme northeastern Mexico. In the Mississippi Valley, they range northward through Illinois and Indiana to southwestern Michigan.

• FOSSIL RECORDS. *Siren simpsoni* (Goin and Auffenberg, 1955) occurs in Pliocene deposits from Alachua County, Florida. The neural arch of the thoracic vertebrae stands high above the centrum. From extant *Siren*, it differs by having straighter zygapophyseal ridges and a wider flare to the aliform processes. *Siren hesterna* (Goin and Auffenberg, 1955) is known from a single vertebra from Miocene deposits in Gilchrist County, Florida (White, 1942). It has a short stubby centrum, strongly diverging zygapophyses, a high neural arch, and wide-flaring aliform processes. *Siren dunni* (Goin and Auffenberg, 1957:83) is based on 3 vertebrae taken from Eocene deposits in Sweetwater County, Wyoming. Its neural arch extends high above the centrum and the zygapophyseal ridge is nearly straight (viewed laterally). From recent sirens it differs in having the zygapophyseal ridges more concave (viewed dorsally). From *S. hesterna* it differs in having a reduced angle and a better developed floor between the aliform processes. From *S. simpsoni* it differs in that the dorsal wing of the transverse process originates nearer the posterior margin of the centrum and swings up gradually to meet the zygapophyseal ridge at an angle of only 40 degrees (rather than 60 degrees).

• PERTINENT LITERATURE. The following references are among the most useful. Descriptions and general biology: Bishop, 1943; Conant, 1958; Carr and Goin, 1955; Cochran, 1961; Freytag, 1965; Kuhn, 1965; Noble and Marshall, 1932. Taxonomic keys: Bishop, 1943; Goin, 1957; Valentine, 1964. General descriptive anatomy: Vaillant, 1863. Comparative anatomical studies: skin, Bernstein, 1953 and Czopek, 1962; Reno *et al.*, 1972; trunk muscles, Auffenberg, 1959, 1962; head muscles, Hilton, 1959; digestive system, Wonderly, 1963; male urogenital system, Willett, 1965; olfactory organs, Hilton, 1951a; choroid plexus of brain, Hilton, 1953; egg capsules, Salthe, 1963. Comparative study of lactic dehydrogenases: Salthe, 1965. Electrophoretic analysis of blood proteins: Guttman, 1965. Comparative rates of enzyme evolution: Salthe and Kaplan, 1966. Egg laying: Noble and Richards, 1932; Goin, 1959; Goin and Goin, 1962; Hubbs, 1962. Induction of metamorphosis: Noble, 1924; Baker and Stoudemayer, 1951. Respiration: Czopek, 1962; Guimond, 1970; Ultsch, 1971. Sound production: Carr, 1940; Maslin, 1950; Gehlbach and Walker, 1970. Evolutionary status: Noble, 1927; Estes, 1965; Salthe, 1967. Fossil record: Goin and Auffenberg, 1955, 1958; Estes, 1965.

• ETYMOLOGY. *Siren* is from the Greek *seiren*, a mythological group of insidious temptresses who lured mariners to destruction. The name alludes to the mermaid-like traits of no legs, a long, curvaceous tail and body (Oesterdam, 1769) and possibly to the sounds they produce. *Siren* is of feminine gender. The scientific and common names are the same.

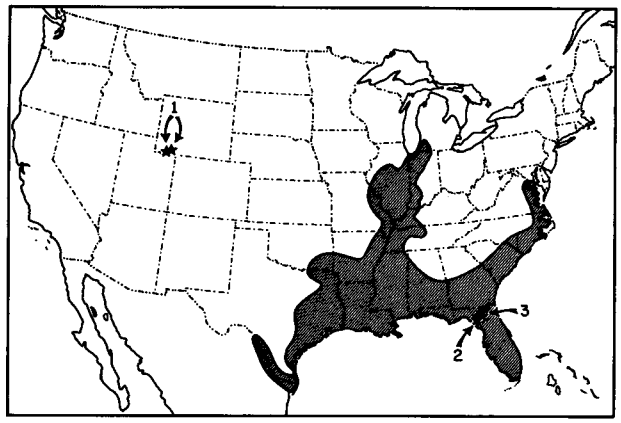
See species accounts for etymologies of living sirens. *S. simpsoni* is named for Clarence Simpson, discoverer of the locality where the fossils were found. *S. dunni* is a patronym for the dedicated herpetologist, Emmett Reid Dunn. *S. hesterna* is derived from the Latin *hesternus*, of yesterday.

• KEY TO SPECIES

1. Adults large, total length more than 500 mm; costal grooves 36 to 40, usually 38; hatchlings and young inconspicuously marked, light yellow stripe on snout 2
– Adults small, total length usually much below 500 mm; costal grooves usually 32 to 35; hatchlings and young conspicuously marked, broad reddish band over snout ..... *intermedia* (in part)
2. Body stocky, maximum length 950 mm; tip of tail rounded; light markings usually absent or form lateral or ventrolateral rows of narrow short bars ..... *lacertina*
– Body slender, maximum length 686 mm; tip of tail pointed; light spots usually present, restricted to venter ..... *intermedia* (in part)

REMARKS

The following have been erroneously classified (Smith and Tihen, 1961): *Siren operculata* Beauvois (1799, Trans. Amer. Philos. Soc. 4:277–281), a senior synonym of *Ambystoma tigrinum*; *S. pisciformis* Shaw (1802, Gen. Zool. 3(2):614), a junior synonym of *Ambystoma mexicanum*; *S. quadrupes* Barton, *nomen nudum.*



MAP. The numbered stars indicate fossil localities. 1. *Siren dunni*, Eocene. 2. *S. hesterna*, Lower Miocene. 3. *S. simpsoni*, Pliocene. See account of *S. lacertina* (Account 128) for Pleistocene records.

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B. S. Martof, North Carolina State University, Raleigh, North Carolina 27607.

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